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JOHANN HEINRICH VON MÄDLER, the son of a respectable citizen of Berlin, was born in that city on May 29, 1794. In infancy he was extremely delicate, and, indeed, at his birth it was scarcely thought that he was alive, or, at any rate, would survive many hours. Medical skill and great care, however, succeeded in preserving a life which must otherwise have been but of short duration, but which was destined to become so useful and so illustrious. But as he grew older, he by degrees acquired strength, and early exhibited a zeal for instruction, which was perceived with pride and satisfaction by his parents and near relatives. His mother was fond of repeating to him that her grandfather had been a professor of oriental languages at Leipzig; and her brother, Herr Strobach, a man of some considerable acquirements, especially in mathematics, frequently urged the cultivation of the talents which he perceived his nephew to possess, and assisted him in his own favourite study. Thus it was resolved to educate him with a view to becoming a tutor, and from the year 1806 he attended diligently the different classes of a gymnasium, then the best school of instruction Berlin afforded. The heads of that institution also noticed his talents, and one of them endeavoured to interest him in the study of theology, to which, however, he showed no inclination.

Most unfortunately for young Mädler, both his parents, in February 1813, fell dangerously ill of a nervous fever, which carried them off within six days. Three young sisters, of the ages of fourteen, eight, and five respectively, were left dependent upon their brother, now only eighteen years of age. The poor girls were almost despaired of, being attacked with the same complaint to which their parents succumbed, and to which also both their kind uncle Strobach and one of his sisters fell victims about the same time. Thus the care of his sisters needed all the energy and industry of Mädler, weighed down in spirits as he was by the loss of his parents, to whom he was devotedly attached, and the thoughts of whom constantly occupied his mind till they were partly diverted into another channel by those mighty political and military events which culminated in the battle of Leipzig.

It had ever been Mädler's wish to devote himself to the study of mathematics and astronomy, of which he as yet was only acquainted with the rudiments. This desire was quickened and excited when, in 1812, a university was founded at Berlin. But, as already mentioned, the loss of his parents and afterwards of his uncle compelled him to postpone for some years availing himself of the advantages thus placed so near him. Night and day he worked, alternately learning and teaching, with the double object of providing for himself and his sisters, and of acquiring the preparatory knowledge necessary for the accomplishment of his cherished wish, to begin his academical studies. At last, after five years of hard work, his perseverance was rewarded

and this wish attained. At the University of Berlin he studied mathematics under Ohm and subsequently under Dirichlet; history, geography, and languages under Junge, Ritter, and others; astronomy under Bode, and afterwards under Encke; making also the acquaintance of Humboldt, whose lectures he attended, and whose attention he attracted. Meanwhile he continued to give lessons, and in 1822 was appointed to an important tutorial post in Berlin, which he occupied, together with his other engagements, until he finally left that city.

In the year 1824 he became acquainted with Wilhelm Beer (brother of Meyerbeer and of the poet Michael Beer), a wealthy banker, who came to him for instruction in astronomy and the higher mathematics, and acquired thereby so great an interest in the former that in the year 1829 he had an observatory built near his villa, provided with an excellent achromatic by Fraunhofer, of $4\frac{1}{2}$ -feet focal length, with which both tutor and pupil pursued their studies. Mädler's own first regular observations, however, were of the planet *Mars* at its opposition in 1828; these led to no satisfactory result, but were repeated some years afterwards with greater success. In 1830, after the completion of Beer's new observatory, the observations of the Moon were commenced. Mädler's original intention was to complete Lohrmann's map, but as only four sheets of that (out of twenty-five) appeared, and they required several corrections and additions, he resolved to measure and delineate himself the whole visible surface of the Moon, and this laborious scheme was completed in 600 nights, from 1830 to 1836. His cousin, Lieut. (afterwards Major) Vogel lithographed the map for him under his own eye, in four quadrants, the first of which appeared in 1834, and at once made Mädler's name famous in the astronomical world. The whole work was published in 1837, the expense, which was considerable, being most liberally defrayed by Beer. During fine nights on which the Moon was near conjunction, the new observatory was employed in physical observations of *Mars*, in determining the rotation of *Jupiter*, and on double stars.

In the year 1833 Mädler was sent by the Prussian Government, in conjunction with General von Gersdorff, to Arcona, the northern point of the island of Rügen, to make astronomical determinations of time, which were necessary for the use of the Russian chronometrical expedition. This commission was executed with success.

Mädler's meteorological observations which he made at Berlin from 1822, and which were regularly published, brought him intimately acquainted with Lichtenstein and Ritter. With them, he became one of the founders of the Berlin Geographical Society; whilst with Humboldt he constantly maintained a most friendly intercourse. The latter, in presenting Mädler with the third part of his *Cosmos*, remarked on the constant reference he had found occasion to make to him in it.

In 1838, his smaller map of the Moon (one foot in diameter)

was published; the year after his great *Selenography*. These works procured him the Lalande, as well as Danish and Prussian medals, and other honours. Shortly after he took his doctor's degree, and received the title of Royal Professor from the King of Prussia, who took the kindest interest in his labours. From 1836 he occupied the position of an observator at the Berlin Observatory, having before that taken part in the calculations. His selenographical labours, which had procured Mädler so many honours, led, by a curious coincidence, to the means by which he became acquainted with his wife. A widow lady, of the name of Witte, in Hanover, who had a great taste for astronomy, and amongst other things made a model of the Moon from her own observations, assisted by Mädler's map, hearing, in the autumn of 1839, that he was at Pyrmont, not far off, travelled there for the purpose of asking his opinion of it. She was accompanied by her eldest daughter, Minna, already known as a poetess, and the result of the visit was that Mädler not only admired her moon model (as Sir John Herschel and Humboldt both afterwards did, and which was purchased by the King of Prussia), but was induced to make a journey to Hanover, and in June of the following year married the daughter, with whom he lived most affectionately nearly thirty-four years, and who survives him. After his marriage he returned for a short time to Berlin, where his lectures during the previous winter had gained universal admiration, and attracted hearers even from Potsdam.

About this time several Directorships of Observatories fell vacant. Soldner had died at Munich, Argelander had left Helsingfors to go to Bonn, whilst W. Struve was removing from Dorpat to the newly-founded Observatory at Pulkowa, and in some other places the erection or renovation of such establishments was being discussed. Mädler received invitations from various quarters, and gave the preference to Dorpat, where he was installed in September 1840, as Professor of Astronomy and Director of the Observatory, which had been founded there by the Russian Government in 1810. This is not the place to describe that noble institution, which, under the successive direction of Struve and Mädler, has acquired so high a position amongst the Observatories of the world. The latter continued his predecessor's investigations into the motions of binary stars, with the aid of the great Fraunhofer refractor, at Dorpat (the largest made by that famous artist). He found the number of clear nights adapted to the purpose insufficient for making a larger map of the Moon, which he had projected, and therefore contented himself with a more detailed examination of certain parts, which was incorporated in a new edition of his Berlin map.

Probably Mädler's name is best known in connection with his famous theory, the so-called Central Sun hypothesis. The labours of many years, the re-observation of the 3222 stars of Bradley's *Catalogue*, with the view of determining and comparing

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their proper motions, conducted him to the conclusion that there were very probable grounds for supposing that the centre of gravity of the whole sidereal universe was situated in the group of the *Pleiades*, not far from the bright star in that cluster known as *Alcyone*, and that our own Sun and solar system moves round that centre of gravity in the period of about 25 millions of years, at the distance of 5,000 billions of miles. Of course, it would be premature to accept absolutely the results of this bold and far-reaching speculation; yet, as they are no mere conjectures on his part, but founded upon a scientific consideration of a large mass of careful and accurate observations, they must claim a certain measure of probability, and will at least form a basis for further investigations, with which the name of Mädler will be for ever associated.

Twice during his residence at Dorpat he was sent by the Russian Government on a scientific expedition to observe the interesting phenomenon of a total eclipse of the Sun. The first of these was in 1851, when he selected Brest-Litowsk, in Poland, for his station; but clouds and rain disappointed his hopes and made it impossible to see the eclipse. But in 1860 he was more successful, and obtained an excellent observation of the phenomenon at Vittoria, in Spain, whither many astronomers of other nations had also repaired.

During the latter part of Mädler's tenure of office at Dorpat, he had the able assistance of Dr. Clausen. But in 1865, having completed 25 years of service there, he resigned and returned to Germany, partly from a disorder in the eyes, which incapacitated him from engaging in observations, and partly from a desire to have leisure to prosecute his great literary work, *The History of Descriptive Astronomy*, which was at last published in two volumes, in 1873, a year before his death. He went first to Wiesbaden to consult a renowned oculist there, and by a most successful operation for cataract, regained his sight, so that he could read and write, with the help of his spectacles, as before. From Wiesbaden he went to Bonn, where he resided three years; and whilst there made a journey to England, and attended the meeting of the British Association at Norwich. He always spoke afterwards with great pleasure of his visit to this country, and particularly to the Royal Observatory at Greenwich. He had been elected an Associate of our Society in 1848.

In the year 1870 he left Bonn, on account of the troubles connected with the French war, and in accordance with the wish of his wife's family, took up his residence in Hanover, where he died, on the 14th of March 1874, at the age of nearly eighty, after an illness of sixteen months, during which he suffered more than twenty cerebral apoplectic fits. His old friend and associate, W. Beer, had died as far back as 1849.

W. T. L.

The following is a list of Professor Mädler's works:—

- Physische Beobachtungen des Mars.* 1830. Reprinted from the *Astronomische Nachrichten*.
- Mappa Selenographica.* Berlin, 1834–36.
- Der Mond, oder allgemeine vergleichende Selenographie.* Berlin, 1837.
- Uebersichtskarte des Mondes.* Berlin, 1837.
- Kurzgefasste Beschreibung des Mondes.* Berlin, 1838.
- Fragments sur les corps célestes du système solaire.* Paris, 1840.
- Leitfaden zur mathematischen Geographie.* Stuttgart, 1842.
- Populäre Astronomie.* Berlin, 1842 and 1861.
- Astronomical Letters.* Reprinted from the *Allgemeine Zeitung*. 3 Parts. Mitau, 1844–45.
- Hind on Comets.* Translated into German, with additions. Leipzig, 1851.
- Berechnung der totalen Sonnenfinsterniss am 28 Juli 1851.* Dorpat, 1850.
- L'éclipse solaire totale du 18 juillet 1860.*
- Ueber totale Sonnenfinsternisse.* Jena, 1861.
- Nachträge zu vorstehendem Werke.* 1862.
- Astronomie zum Schulgebrauch.* Essen, 1862.
- Beobachtungen der Univers-Sternwarte.* Vols. IX. to XV. Dorpat, 1841–63.
- Der Himmel. Astronomie zum Volksgebrauch.* Hamburg.
- Reden und Abhandlungen über Gegenstände der Himmelskunde.* Berlin, 1870.
- Geschichte der Himmelskunde, von der Ältesten bis auf die neueste Zeit.* 2 Vols. Brunswick, 1873.
- [What follow are on the fixed stars and sidereal universe.]
- Die Centralsonne.* First printed in the *Astronomische Nachrichten* for July 1846.
- Untersuchungen über die Fixsternsysteme.* 2 Parts. Dorpat, 1847–48.
- Katalog der 3222 Bradley'schen Sterne nach ihren Oertern berechnet.* Dorpat Observations, 1853.
- Die Eigenbewegung der Fixsterne.* Dorpat Observations, 1856.
- Beiträge zur Fixsternkunde.*
- Prize Paper of the Harlaem Society of Sciences.* 1856.
- Uebersichtstafel der Doppelsternbewegungen.* Dorpat Observations, 1857.
- Die Eigenbewegungen der Fixsterne in ihren Beziehungen zum Gesamtsystem.* Dorpat Observations, 1857.
- Der Fixsternhimmel.* Leipzig, 1858.
- Grundlagen von Mädler's Katalog der 3222 von ihm berechneten Bradley'schen Sterne.* Dorpat Observations, 1866.

Of the life of PHILIPPE GUSTAVE DOULCET, Comte de PONTÉCOULANT, we have not been able to obtain many particulars. He was born in 1795, and was a scholar of the Polytechnic School